Operating Engineers and Other Construction Equipment Operators

Table of Contents *(scroll or use links below to navigate document)*

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What They Do

Whenever big construction equipment is hard at work, it draws a crowd. Maybe it's just human nature but it seems like everyone likes to watch huge machines bang, crush, smash, pulverize, pound, or demolish whatever is in the way. Taming these monster machines is the job of the Operating Engineers and Other Construction Equipment Operators.

Operating Engineers (also known as Construction Machine Operators) use different types of heavy equipment on construction work sites. Simply put, they use these heavy duty machines to move things around. Most of the time, they dig, scrape, cut, and move dirt, rocks, stones, and boulders. Some equipment is designed to move construction materials from where it is delivered to where the workers need it. Other equipment is designed to smash rocks, boulders, buildings, and other things that need to be demolished. Some equipment is used to crush materials, and still others are made to squeeze, press, and squish material such as asphalt so that it can stick together well and form a solid roadway. These machines include bulldozers, backhoes, graders, trench diggers, excavators, loaders, paving machines, rollers, cranes, pile drivers, pumps, tractors, scrapers, and other machines.

Besides operating the controls of these impressive machines, Operating Engineers also inspect their vehicles for safe operation prior to using them. They also may help set up these machines, perform routine maintenance on them, and make minor repairs.

Tasks

- Start engine, move throttle, switches, levers, and depress pedals to operate machines, equipment, and attachments.
- Adjust handwheels and depress pedals to drive machines and control attachments, such as blades, buckets, scrapers, and swing booms.
- Turn valves to control air and water output of compressors and pumps.
- Fasten bulldozer blade or other attachment to tractor, using hitches.
- Align machine, cutterhead, or depth gauge marker with reference stakes and guidelines on ground or position equipment following hand signals of assistant.
- Connect hydraulic hoses, belts, mechanical linkage, or power takeoff shaft to tractor.
- Signal operator to guide movement of tractor-drawn machine.

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Operating Engineers and Other Construction Equipment Operators

- Drive equipment in successive passes over working area to achieve specified result, such as grade terrain or remove, dump, or spread earth and rock.
- Grease, oil, and perform minor repairs on tractor, using grease gun, oil cans, and hand tools.
- Repair and maintain equipment.

*Detailed descriptions of this occupation may be found in the Occupational Information Network (O*NET) at online.onetcenter.org.*

Important Skills, Knowledge, and Abilities

- Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
- Building and Construction — Knowledge of materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures such as highways and roads.
- Operation and Control — Controlling operations of equipment or systems.
- Equipment Maintenance — Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.
- Repairing — Repairing machines or systems using the needed tools.
- Operation Monitoring — Watching gauges, dials, or other indicators to make sure a machine is working properly.
- Equipment Selection — Determining the kind of tools and equipment needed to do a job.
- Troubleshooting — Determining causes of operating errors and deciding what to do about it.
- Multilimb Coordination — The ability to coordinate two or more limbs (for example, two arms, two legs, or one leg and one arm) while sitting, standing, or lying down. It does not involve performing the activities while the whole body is in motion.
- Control Precision — The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.
- Problem Sensitivity — The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
- Manual Dexterity — The ability to quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects.
- Visualization — The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.

Work Environment

As impressive as some of these large machines are, they can also be dangerous in untrained, inexperienced hands. When a bulldozer rolls over or a ten-story high crane crashes, it's not something that witnesses will soon forget. Thankfully, accidents involving these huge machines are rare. Proper training and appropriate respect for the 'heavy metal' is at least partly responsible for the low death and serious injury rate. Proper operation often requires the use of fellow workers who help guide the machine as it is moving, warning away unobservant people.

Work can slow or even stop when the weather doesn't cooperate. Heavy rain, snow, or high winds can force equipment operators off their machines. Workers are often exposed to the elements and may have to contend with heat, cold, and other unpleasant weather conditions. Some large machines have enclosed cabs that can protect the worker from adverse weather conditions. Some

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Operating Engineers and Other Construction Equipment Operators

equipment with cabs offer air-conditioning. However, the worker still must operate his or her machine with regard to weather conditions and adjust operation accordingly.

Operating Engineers usually work 40-hours or more workweek. They frequently work overtime and may work longer on weekdays or work six days a week in good weather or during the summer. Much of their work is done from March through November.

Union membership requirements depend upon whether the contractor in charge of the project has an agreement with the labor union. When union operators are required, Operating Engineers in California belong to the International Union of Operating Engineers. Those working for the government may join a public employee union.

California's Job Outlook and Wages

The California Outlook and Wage table below represents the occupation across all industries.

Standard Occupational Classification	Estimated Number of Workers 2004	Estimated Number of Workers 2014	Average Annual Openings	2006 Wage Range (per hour)
Operating Engineers and Other Construction Equipment Operators				
47-2073	31,800	38,600	1,500	$20.56 to $33.02

Wages do not reflect self-employment.
***Average annual openings** include new jobs plus net replacements.*
Source: www.labormarketinfo.edd.ca.gov, Employment Projections by Occupation and OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.

Trends

Operating Engineers and Other Construction Equipment Operators will grow at a faster rate compared with all other occupations in California. Employment prospects in the field tend to follow construction activity. When there is high demand for housing and other buildings, Operating Engineers have a busy schedule. When construction slows, they may work fewer hours or have interrupted work schedules. Overall, however, the future is bright since the rapid population growth in California shows no sign of letting up in the next several decades.

Training/Requirements/Apprenticeships

Employers generally prefer to hire workers who have a high school diploma or equivalent. Some engineers have learned how to operate heavy equipment on the job, while others have received training in vocational schools or through apprenticeship programs. Previous experience operating farm equipment or heavy equipment in the armed forces can be an advantage when looking for a entry position in the field.

Information regarding apprenticeship programs for Operating Engineers can be found on the California Department of Industrial Relations, Division of Apprenticeship Standards Web site at www.dir.ca.gov/das.

Recommended High School Course Work

High school preparation should include courses in automotive shop, metal shop, and basic mathematics.

Operating Engineers and Other Construction Equipment Operators

Where Do I Find the Job?

For those Operating Engineers who belong to a union, the union hall is a good place to find employment. Others can look for work with established companies or can try to find employment on a temporary basis. Direct application to employers remains one of the most effective job search methods.

Use the *Search for Employers by Industry* feature on the *Career Center* page at www.labormarketinfo.edd.ca.gov to locate employers in your area. Search using keywords from the following construction industry names to get a list of private firms and their addresses:

- Commercial Building
- Construction Sand and Gravel Mining
- Dimension Stone Mining and Quarrying
- Industrial Building
- New Multifamily Housing
- New Single-Family Housing
- Oil and Gas Pipeline
- Other Crushed Stone Mining and Quarrying
- Other Heavy Construction
- Power/Communication System
- Residential Remodelers
- Water and Sewer System

For local listings of contractors, search these **yellow page** headings for listings of private firms:

- Building Contractors, Commercial/Industrial
- Building Contractors, General
- Concrete Contractors
- Demolition Contractors
- Excavating Contractors
- Foundation Contractors
- General Engineering Contractors
- Landscape Contractors
- Paving Contractors
- Pipeline Contractors

Where Can The Job Lead?

Some Operating Engineers become foremen, supervisors, or project managers. It is also possible to obtain a specialty contractor's license in Earthwork and Paving from the California Contractors State License Board, buy one's own equipment, and bid on construction projects.

Other Sources of Information

International Union of Operating Engineers
www.iuoe.org

California Department of Industrial Relations, Division of Apprenticeship Standards
www.dir.ca.gov/das

California Department of Consumer Affairs, Contractors State License Board
www.cslb.ca.gov

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